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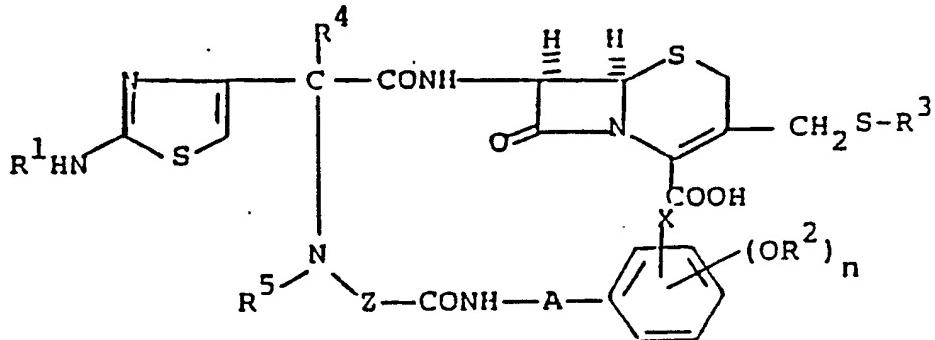
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(54) 3-Heterocyclithiomethyl cephalosporins.

(57) Acyl derivatives of the general formula



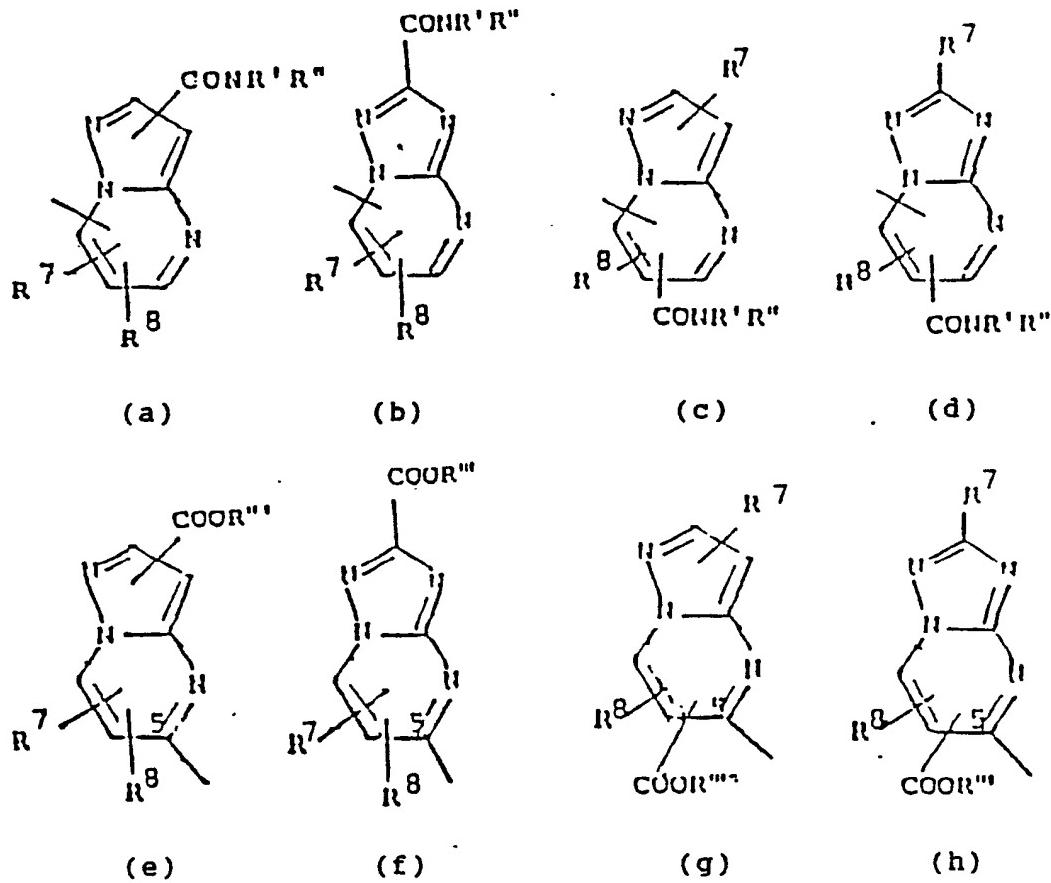
in which A signifies a group of the general formulae

-NHCO-, -NHCONHCO-, -NHC $\text{OCH}=\text{CH}$ -,

$-\text{N}=\text{C}-$



wherein  $\text{R}^6$  represents hydrogen or lower alkyl;  $\text{R}^1$  and  $\text{R}^2$  in each case signify hydrogen or a protecting group, X signifies hydrogen, halogen, lower alkoxy, nitro or an additional group -OR<sup>2</sup>, n signifies the number 1 or 2, R<sup>4</sup> and R<sup>5</sup> both signify hydrogen or together signify an additional bond and Z signifies a direct bond or carbonyl (where R<sup>4</sup> and R<sup>5</sup> both represent hydrogen) or a group of the formula -O-B- (where R<sup>4</sup> and R<sup>5</sup> together represent an additional bond) in which B signifies straight-chain, branched or cyclic lower alkylene; and wherein further R<sup>3</sup> signifies a substituted bicyclic group of the general formulae



in which R<sup>7</sup> and R<sup>8</sup> each individually represent hydrogen, lower alkyl or trifluoromethyl or (in formulae (a), (b), (e) and (f)) together represent alkylene with 3 or 4 carbon atoms and R', R'' and R''' each individually represent hydrogen, lower alkyl or lower cycloalkyl; whereby compounds of formula I in which R<sup>4</sup> and R<sup>5</sup> together represent an additional bond are present in the syn-isomeric form or as a mixture with the anti-isomeric form in which the syn-isomeric form predominates,

as well as readily hydrolyzable esters and salts of these compounds and hydrates of the compounds of formula I or of their esters and salts.

The compounds have antibiotic activity.



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## EUROPEAN SEARCH REPORT

Application Number

EP 88 10 5733

| DOCUMENTS CONSIDERED TO BE RELEVANT   |   |   | CLASSIFICATION OF THE APPLICATION (Int. Cl. 4) |
|---|---|---|--|
| Category  | Citation of document with indication, where appropriate, of relevant passages                                     | Relevant to claim   |  |
| Y   | EP-A-0 189 287 (NIPPON PHARMACEUTICAL DEVELOPMENT INSTITUTE CO., LTD)<br>* Page 0; pages 119-127; claims *<br>--- | 1-35  | C 07 D 501/36<br>A 61 K 31/545                 |
| Y   | EP-A-0 150 507 (MOCHIDA)<br>* Page 0; pages 177-221: claims *<br>---  | 1-35  |  |
| P,A   | EP-A-0 254 495 (SANKEI PHARMACEUTICAL CO., LTD)<br>* Pages 50-63: claims *<br>-----                               | 1-35  |  |
|   |   |   | TECHNICAL FIELDS SEARCHED (Int. Cl.4)          |
|   |   |   | C 07 D 501/00                                  |
| <p>The present search report has been drawn up for all claims</p>   |   |   |  |
| Place of search   | Date of completion of the search  | Examiner  |  |
| THE HAGUE   | 01-08-1990  | LUYTEN H.   |  |
| CATEGORY OF CITED DOCUMENTS   |   | T : theory or principle underlying the invention<br>E : earlier patent document, but published on, or after the filing date<br>D : document cited in the application<br>L : document cited for other reasons<br>.....<br>& : member of the same patent family, corresponding document |  |
| X : particularly relevant if taken alone<br>Y : particularly relevant if combined with another document of the same category<br>A : technological background<br>O : non-written disclosure<br>P : intermediate document |   |   |  |